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ABSTRACT

This review of followup studies of graduates of vocational-technical education programs includes studies published since 1965 and covers the major fields of vocational-technical education at secondary, post secondary, and adult levels. Programs for special groups of individuals are also included. Two purposes of the review are (1) to identify the job histories of graduates and (2) to provide base line data for program evaluation. The review is organized around the following topics: The Role of Followup Studies, General Surveys, Studies of Specific Programs, Summaries of Placement Information, Studies of Special Groups, Benefit-Cost Studies, Followup Studies Procedures, and Evaluation Summary. A 101-item bibliography is included. A related document is VT 010 176. (CH)

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Research

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review and
synthesis of
research on

The Placement and Follow-up of Vocational Education Students

ERIC Clearinghouse on Vocational and Technical Education

The Center for Vocational and Technical Education

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REVIEW AND SYNTHESIS OF RESEARCH ON THE PLACEMENT AND FOLLOW-UP OF VOCATIONAL EDUCATION STUDENTS

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February 1970

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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PREFACE

This *Review and Synthesis of Research on The Placement and Follow-up of Vocational Education Students* is one of a series of "state of the art" papers in vocational and technical education and related fields. It should assist in identifying substantive problems and methodological approaches for researchers, as well as providing practitioners with a summary of research findings which have application to educational programs. In the field of vocational and technical education, the pace of research and development activities has increased considerably during the period under review. Gaps which exist for some readers are probably the result of the author's prerogative to be selective.

As one of a series of information analysis papers released by the ERIC Clearinghouse on Vocational and Technical Education, this review is intended to provide researchers, curriculum development specialists, and practitioners with an authorative analysis of the literature in the field. Those who wish to examine primary sources of information should utilize the bibliography. Where ERIC Document numbers and ERIC Document Reproduction Service prices are cited, the documents are available in microfiche and hardcopy forms.

The profession is indebted to J. Kenneth Little for his scholarship in the preparations of this report. Recognition is also due James E. Bottoms, Associate State Director of Vocational Education, Georgia and Jacob J. Kaufman, Director and Professor of Economics, Institute for Research on Human Resources, Pennsylvania State University, for their critical review of the manuscript prior to its final revision and publication. Joel Magisos, information specialist at The Center, coordinated the publication's development.

Members of the profession are invited to offer suggestions for the improvement of the review and synthesis series and to suggest specific topics or problems for future reviews.

Robert E. Taylor
Director
The Center for Vocational
and Technical Education
ERIC Clearinghouse

INTRODUCTION

This publication surveys recent follow-up studies of graduates of programs of vocational-technical education, particularly those which have appeared since 1965. The studies reported are those which have come to the attention of: 1) The ERIC Clearinghouse on Vocational and Technical Education at the Ohio State University, Columbus; 2) The Center for Studies in Vocational and Technical Education, University of Wisconsin, Madison; 3) or, have been located through searches of recent indexes of research literature. The reviewer made a quick survey of the Research Coordinating Units of State Departments and Divisions of Vocational Education in Spring, 1969 and received from them some very recent input.

The studies cited are the largest part of all studies reviewed, but they are but a sample of the probable national output. The studies chosen for reference in this review have decidedly uneven merit, but as a whole they are believed to be a cross section of follow-up studies completed within the past five years.

The review covers the major fields of vocational-technical education at secondary, post-secondary and adult levels, and includes programs intended for special groups of individuals. In some areas, the coverage is skimpy; but, the skimpiness may match the paucity of research in the area, or the inadequacy of the sources of information available to the reviewer.

The purpose of the review has been to mine the literature for significant trends in the job histories of graduates of programs of vocational and technical education; and through such information to provide baselines for evaluating vocational programs of education and training. Panning for gold in this survey was not highly rewarding, but some glittering sands suggest that better pay-offs may soon appear.

This review was assisted by staff members of The Center for Studies in Vocational and Technical Education, University of Wisconsin, particularly, Merle E. Strong, Research Associate; Richard Whinfield, administrative associate; Virginia Wolters, information specialist; and Mildred E. Hammes, secretary. The Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University, Columbus made pertinent and recent inputs to its ERIC Clearinghouse available. To all these persons or groups I give thanks.

J. Kenneth Little

TABLE OF CONTENTS

	Page
PREFACE	iii
INTRODUCTION	v
THE ROLE OF FOLLOW-UP STUDIES	3
GENERAL SURVEYS	4
National Surveys	4
Regional and State Studies	5
School Systems	10
STUDIES OF SPECIFIC PROGRAMS	12
Agricultural Education	12
Distributive Education	13
Health Occupations	14
Home Economics	15
Office Occupations	16
Technical Occupations	17
Trade and Industrial	17
SUMMARIES OF PLACEMENT INFORMATION	20
Statistical Summary	20
How Employment was Obtained	21
Placement	22
Geographic Mobility	22
Earnings	23
Job Stability and Satisfaction	24
Continuing Education	26
STUDIES OF SPECIAL GROUPS	26
Manpower Development and Training	26
Correctional Institutions	28
Military Trainees	29
Older Workers	30
Early-leavers	30
BENEFIT-COST STUDIES	31
FOLLOW-UP STUDY PROCEDURES	33
EVALUATION SUMMARY	34
BIBLIOGRAPHY	39

REVIEW AND SYNTHESIS OF RESEARCH ON THE PLACEMENT AND FOLLOW-UP OF VOCATIONAL STUDENTS

THE ROLE OF FOLLOW-UP STUDIES

Despite burgeoning enrollments in colleges and universities, at least three-fourths of American youth have been leaving the formal school system before achieving a baccalaureate degree. This great majority of youth step off the educational ladder to some rung on the occupational ladder. Whatever the level of schooling at which this transition from school to work occurs, the individual's readiness and opportunity to find satisfactory employment is important to the maintaining of his self-respect and dignity as an individual; and the ability of society to afford economic security to people with varying levels of educational attainment and occupational experience lies near the heart of sustaining a safe and sound society. It is vital, therefore, that educational planners examine carefully the basic relationship of school programs to the needs of all individuals for occupational preparation, and to the nature of the preparation which schools should and can provide.

Startling developments in science and technology and a fast expanding economy are spelling out important changes in the structure of the occupational world. Specific jobs become obsolescent more frequently. Old occupations disappear and new occupations emerge, not always in foreseeable fashion. These developments also have much significance in planning responsible and responsive programs of occupational preparation.

The American public school system, with the assistance of the Federal Government, has for years given special support to school programs designed to prepare youth for specific areas of employment. Following the advent of Sputnik, strong emphasis was given to increasing the number and quality of highly trained scientists and engineers. The goal was to help the nation's "academically talented youth" climb to the highest rungs of the educational ladder. Graduate education and research were the objects of attention and affection. Since 1963, however, the scene has shifted. Society has discovered pockets of poverty and islands of neglect both among its people and its educational system. Attention now focuses upon the great majority of its citizens who climb only to lower rungs of the ladder, who occupy the great majority of positions in the occupational world, and who finally form the bedrock of American society.

It is important, therefore, that educational planners and school administrators inform themselves upon such questions as:

a) What happens to the young men and women who try to find work instead of continuing school beyond graduation?

b) Are there important differences between the job-finding experiences of graduates of vocational education programs and the experiences of students who graduate without such preparation?

c) Does the school program, teaching staff, and counseling service assist youth who go to work as effectively as it assists youth who go to college?

While this review deals with information about the vocational education programs, recent recommendations suggest their relevance to the whole educational system. The National Advisory Commission on Vocational Education stated the basic concept that "Vocational education is not a separate discipline within education, but it is a basic objective of all education and must be a basic element of each person's education. . . The common objective should be a successful life in which employment has a crucial role." (Advisory Council on Vocational Education, 1967).

GENERAL SURVEYS

National Surveys. A study conducted by the U.S. Office of Education in 1966 gathered follow-up information on 606,872 students who had graduated from cooperative and preparatory programs in all areas of vocational education. The findings indicated that 80 percent of all graduates available for placement "were placed in the specific occupation for which they completed training or in a related occupation." By special field the percentages were: agriculture, 67 percent; home economics, 76 percent; distributive, 78 percent; trade and industry, 80 percent; office, 81 percent; technical, 90 percent; health, 92 percent. Only four percent of the graduates were unemployed; 23 percent had continued full-time schooling; and eight percent had entered the Armed Forces. This study does not separate graduates of secondary, post-secondary, and adult level programs, nor men graduates from women graduates. In general, however, the percentages that were cited increase with the proportion of graduates from post-secondary and adult programs. The types of occupations most frequently entered from each field of preparation are listed. The report notes "general lack of national data on placement and follow-up and an absence of any system for reporting these data in detail." (Committee on Labor and Public Welfare, U.S. Senate, 1968).

Eninger's study (1968) provides comprehensive follow-up information about 5,327 graduates of a random sample of 100 secondary schools offering vocational programs in trade and industry. To gain a longitudinal dimension, he used graduates of the classes of 1953, 1958 and 1962. Graduates of both vocational schools and comprehensive schools were included. The study is designed to provide a basis for recommending standard "evaluative measures for assessing how well schools are meeting their educational objectives," indicating: 1) time required to get a full-time job; 2) relatedness of job to training; 3) job satisfaction; 4) earnings and earning progression; 5) employment security; 6) employer stability; 7) geographic mobility. The study compares information about graduates of the three years selected; of vocational and comprehensive schools; of vocational and non-vocational graduates; and of minority and non-minority groups. Non-vocational information includes amounts and years of subsequent formal schooling,

measures of conversational interests, types of leisure activities, organizational affiliations, and attitudes toward the school from which they graduated. The study used questionnaires followed by interviews and other special procedures to follow up a 10 percent sample of nonparticipants. Eninger's prodigious study points the way to the type of study required for comprehensive evaluation of educational programs. Specific findings of this study will be reported in a later section on trade and industry programs.

Regional and State Studies. Over 5,000 graduates of vocational, academic, and general curricula of 25 schools in nine cities of Ohio, Pennsylvania, Maryland and New Jersey were interviewed in a comprehensive effort to obtain useful information about the adequacy and image of vocational education programs, and about ability of such programs to serve the problems of minority groups (Kaufman, et. al., 1967).

The group interviewed was augmented by over 3,000 persons who responded by mail questionnaires. The schools were visited by teams of "guidance experts and representatives from labor and management," classes were observed, and interviews held with administrators, teachers, and students. Teachers also responded to questionnaires asking their attitudes toward vocational education and college-preparatory education. More than 650 employers were interviewed in addition to 90 union officials. Supervisors on the jobs held by graduates rated the job performance of the graduates. Graduates of vocational programs who continued to college were not included in the study. The kinds of information gathered include – type of job; how obtained; length of time held; type of company; pay, ratings of school preparation; job satisfaction; reasons for leaving jobs; school and family background. The investigators assert that the findings of this study do not make a clear case "that vocational education has a direct pay-off in the occupational experiences of its graduates." Graduates of vocational programs were placed more frequently in manufacturing jobs while graduates of academic and general curricula were placed more frequently in white collar, primarily clerical, jobs. On the average, no important differences were found among the groups of graduates in the three types of curricula in terms of earnings, tenure in job, and satisfaction with job. Specific findings about graduates in the several vocational education fields were reported in a later section of this report.

Mallinson (1968) reports interviews with a sample of 340 non-college bound, vocationally oriented students who were matched with a group of college-bound peers, on scores from science, interest and intelligence tests. The students were drawn from 11 communities within the states of Illinois, Indiana, Michigan and Ohio. Both groups had participated in a Science Motivation Project which provided extensive background information completed in 1963. The two groups were compared on personal and family characteristics, educational aspiration, and attainment, and satisfaction with school programs. Interviews were conducted in 1966. For the purposes of this review, however, the findings are summarized but not detailed. It is

not reported, for example, how many of the non-college bound youth had taken a vocational education program in the secondary school. The non-college bound youth moved into a wide variety of occupations, the range being extended by the fact that 43 percent had received some type of vocational training since leaving high school. Most common types of training were: among men—apprenticeships, business, and data processing; among women—nursing, beautician, data processing. In general, the students were satisfied with their post-secondary school vocational training, but they voice frequent complaints about lack of occupational counsel, occupational information, and placement service.

Olien and Donohue (1968) report a study of the relationship between occupational expectation and occupational attainment among a sample of over 500 women who graduated from 20 Minnesota high schools in 1956. The occupation held at the time of the study in 1963 was used as the measure of attainment. Findings include: 1) Meaningful correlation between occupations expected in 1956 and occupations held in 1963 indicated high reality assessment; 2) the higher the occupational expectation, the lower the frequency of successful attainment. Girls in city attain professional goals proportionately more often than girls on farms; 3) level of occupational aspiration and attainment is associated with the level of occupation held by the father; 4) half of the girls who planned to go to a vocational school did not continue to any school; although 18 percent attended college.

The authors point out that the same complex of socioeconomic and cultural factors that operate in the occupational attainment of men is observed also in the occupational attainment of women, and comment upon other barriers that are associated with failure to emphasize educational advancement for girls from farm and "blue collar" families.

Young (1968) reports a study of the occupations of 257 graduates of secondary schools of five counties and surrounding area in Eastern Iowa. These graduates were a 12 percent random sample of all seniors graduating from high schools in that area in 1963. The follow-up inquiry was conducted in the fall of 1966. The survey was part of a needs and feasibility study for establishing a community college, which fact may have produced a bias in the pattern of response to the inquiry. Only 16 percent of the boys and 28 percent of the girls had taken a vocational education program in secondary school, but 22 percent of the men and 41 percent of the women reported taking some program of occupational preparation after graduation from secondary school. Data on earnings were not meaningful. About a fourth of the men and women had received on-the-job training. Interest in further education was for men, job improvement; for women, self-improvement. The author comments that "the relatively large percent of respondents who had continued their education may indicate a bias in favor of those who had already satisfied their needs."

Kaufman and Lewis (1968) report a comprehensive study of graduates of vocational, academic, and general curricula in a small, a medium-sized, and a large city of Pennsylvania. The report on the graduates is part of

a larger effort to evaluate the extent to which vocational and technical education have penetrated the curriculum and school enrollment in these schools, the responsiveness of the vocational programs to students and societal needs, the employment experience of the vocational education graduates and their evaluation of their school experience, and the cost-effectiveness of the vocational education programs. The cities used are not identified, but the "small" school was a city with less than 100,000 populations; the "large" school was in a city having a population of more than 500,000. The "medium-sized," a population between 108,000-500,000. The schools were selected, not randomly chosen, from among schools generally acknowledged among vocational educators to have good vocational programs. The employment information was gathered by interviews with 1,780 graduates distributed among the curricula from which graduated, as follows: vocational, 42 percent; general, 41 percent; and academic, 17 percent. The number of interviews contacted among the graduates of the three cities was about equal.

The findings on the employment experiences of the graduates of vocational programs as a whole include: 1) vocational graduates started at a medium wage rate equal to that of graduates of other curricula; but over their total employment history the vocational graduates had less time unemployed, received more rapid increases in earnings, and had higher average monthly earnings; 2) the extra earnings of the vocational graduates justified the costs of their education; 3) although vocational education was most useful for those finding jobs related to their training, less than half of the male graduates obtained jobs directly related to their training. Implications of these findings are suggested, raising questions especially about priorities to be given to size and types of vocational programs in secondary schools.

A state-wide follow-up study of the occupations of the 1957 male secondary school graduates of Wisconsin is reported by Little (1967). This study reports the occupations held in 1965 by a one-third sample of male graduates of 95 percent of public and private secondary schools. The graduates were separated into three groups: a) those who attended college; b) those who attended a post-secondary vocational or technical school; c) those who attended no post-secondary school. The three groups are compared in terms of these ratings of the occupations held on the North-Hatt occupational prestige scale. The results show a high degree of overlapping in levels of jobs attained by the three groups of students, especially among occupations in the middle range of the occupational prestige scale. This is the range, of course, in which most persons find their careers. An especially interesting finding was that, within each of the three groups, the prestige level of occupations attained had very little correlation with the level of scholastic achievement in high school. The data appeared to say that, regardless of the academic record in high school, the student who continues further schooling improves his chance of increasing the level of occupation he will attain. At the college level, students who had ranked in the top

tenth of their class pulled away from other college students in reaching occupations of high prestige. Students who attended college but did not graduate, however, attained occupations of the type and level much like those attained by the middle half of the other two groups. The inter-relationship of sociological and psychological factors in determining occupational aspiration and attainment are elaborated by Sewell and Shah (1968).

A state-wide follow-up study in Colorado (Colorado RCU, 1966) analyzed the job history information of a sample of 350 graduates of Colorado secondary schools. The survey was completed in 1965, two years after the students had graduated. The graduates were divided into four groups: a) those who went directly to school(N=123); b) those who went directly to work (N=84); c) those who went to school then to work (N=83); d) those who went to work then to school (N=60). The 350 students were respondents from an original sample of 623 graduates chosen at random from over 19,000 graduates listed according to the location of their schools in five regions of the state. Less than eight percent of the total group had pursued a vocational education major. Of these, who began working after completing secondary school, 16 percent had enrolled in the vocational education program, and 66 percent enrolled in a general curriculum (non-college, preparatory). The jobs held fell primarily in three employment groups: a) hospital, education, and government; b) business and service; and c) retail and wholesale trades. A third of the group who went directly to jobs after graduation were employed as laborers. The greatest job stability occurred among the women graduates who remained in clerical, sales, and secretarial types of employment. Analysis of the characteristics of post-high school attendance revealed that a majority of the "school-to-work group" had attended schools which offered vocational preparation. More than half of those in jobs rather than in school stated that their secondary school subjects were not helpful in obtaining jobs. Forty percent of these graduates also stated they would have attended post-secondary vocational education classes if they had been offered in their hometown. Three-fourths of the "directly to work" group stated a preference for educational programs below the four-year baccalaureate degree, one-fourth for no education beyond the high school level. An important feature of this study is the report of a telephone follow up of 141 graduates who did not respond to the questionnaire survey. The effort yielded responses from only 16 graduates (11 percent). Some of the differences between the responses of these 16 graduates and the responses of the 350 who responded initially illustrate the importance of securing as high rates of response as possible. The telephoned group was older, more frequently female, less frequently in the college-preparatory curriculum, and were more frequently at work in a metropolitan area. Statistical tests of the significance of the differences were not reported.

Whinfield (1969) compared the occupational status and earnings of 1961 and 1964 graduates of two-year technical institute programs with those of

graduates of two-year University academic programs in Kenosha and Wausau, Wisconsin. The study used only those graduates who did not continue their studies beyond the completion of the two-year programs. Comparisons include students who did not complete either of the programs. Findings indicate that level of occupation and earnings may be associated more with completion of a program, than with the type of program completed.

Differences in average cultural and scholastic background between the technical and academic program graduates tend to obscure interpretation of the results. Technical program students averaged somewhat lower in usual measures of scholastic aptitude and achievement, but technical program graduates were achieving at least equally in the world of work. Interesting sex differences are noted. This type of study should be replicated, with special attention to the types of technical training taken by the graduates, and to levels of aptitude.

Follow-up studies of graduates of four area vocational schools in New Mexico describe type of positions attained by graduates of vocational-technical programs at the post-secondary level. Data vary among the schools but information for some includes types of positions attained, earnings, job progression, manner of placement, place of employment, and relevance of training (New Mexico State Department of Education, 1968). Findings and recommendations reported by this study include:

1. Over two-thirds of the graduates found employment; over 82 percent in training-related occupations.
2. Over 72 percent found their jobs in their home communities.
3. While 31 percent were gainfully employed at the time of the inquiry, about half of these graduates were either attending school, serving in the armed forces, or were married and managing households. A fourth were temporarily unemployed after having held occupations.
4. The average graduate had been on the job only a year or less; hence salary levels and advancement were neither discouraging nor impressive.
5. The graduates believed that their occupational training programs should have been more specialized, but also that a larger component of liberal studies should have been available.

A comprehensive data bank of responses of 1965 graduates of secondary schools in Missouri furnishes a great variety of descriptive information about the family backgrounds, post-secondary occupational and educational status, mobility, and graduate opinions of secondary school training. This information provides fertile opportunity for many types of further investigation (State Department of Education, Missouri, 1968).

A five and ten year follow-up study of graduates of all 14 of Connecticut's state-operated regional vocational-technical schools revealed the following information about their 1953 and 1958 graduates includes these major findings: a) 72 percent were still employed in jobs related to their

training; b) earnings were, 1958 class, at the end of five years, $5,746; 1953 class at the end of ten years, $7,085. The earnings in both groups in 1963 was substantially higher than the average earnings in the State; c) less than six percent had moved to another state; d) with passage of time following graduation, the proportion continuing education increases—13 percent of the 1958 graduates; 28 percent of the 1953 graduates; e) also differences between the occupations of the 1953 graduates and the 1958 graduates showed a progression toward employment in professional, management, and supervising positions and toward becoming self-employed by from two percent to fifteen percent of the graduates; f) 61 percent were in apprenticeship training or had reached journeyman status. These findings were based on responses of 682 out of 1408 graduates (48 percent).

School Systems. Studies completed by school systems are becoming more evident. An example is that reported for Tulsa, Oklahoma (Tulsa Public Schools, 1964, 1968). Reference is made to it because of the opportunity afforded to compare its results with an earlier study reported by the same system in 1964. The care with which the studies were designed, analyzed and reported, make them useful references for persons planning similar programs for their school systems. An exemplary feature of the data provided in the 1964 study is a detailed analysis of the post-secondary educational and occupational history of all graduates in terms of the type of secondary school curriculum in which they were enrolled. The study details findings for each of four years following graduation in 1960. Findings include: a) only 15.2 percent of the graduates were enrolled in a vocational education curriculum; yet by 1963, 34 percent were gainfully employed in the labor market; b) 60 percent of the graduates who had obtained service, semi-skilled or skilled jobs had taken no courses in vocational education; c) of the gainfully employed graduates in 1963, 11 percent had attended a post-secondary vocational or trade school; d) seven out of ten of the employed graduates were in clerical, sales, service, or semi-skilled occupations; e) the scholastic ability ranges of those in various occupations were in IQ (Otis) scores: clerical (73-132); sales (73-132); services (71-127); skilled (73-126); semi-skilled (71-133); unskilled (71-127); managerial or semi-professional (80-115); agricultural (80-95).

The 1968 study follows up the 1967 graduates and reports small increases in attendance at post-secondary institutions. A major change in the employment of boys in clerical jobs is noted. In 1964, the percentage was 5.8 percent; in 1968, the percentage was 18.2 percent. Over 35 percent of the graduates were employed by 52 firms in Tulsa, and a sizeable majority had jobs within that city and its environs. Employed graduates vote their vocational courses as the "most beneficial" of their secondary school courses, and add "mathematics" as the field in which they would take additional courses. From 40 percent to 50 percent of these graduates report that school counsel and assistance on educational and vocational planning was inadequate.

An extensive follow-up study of the 1966 graduates of seven of eight high school districts in San Mateo county, California (San Mateo Union High School District, 1968) furnishes much descriptive information about the educational and occupational choices of all graduates of each of these schools. The study reports occupations held one year after graduation. The information illuminates the differences between the opinions of college-bound and job-bound graduates about the helpfulness of their school programs, teachers and counselors, and the experiences of graduates in obtaining employment. Graduates of vocational programs frequently reported in the vein that these courses were "very worthwhile," "most valuable of any of my courses," "provided a solid background for my job." Graduates of the college-preparatory programs were frequently critical of their high school courses as preparatory for either college or work. The study, however, does not identify the graduates in terms of their enrollment in vocational education programs in high school nor indicate whether such programs were offered. The types of occupations held by the graduates were reported in terms of U.S. Census classifications and show that 59 percent of the graduates were "clerical and kindred workers," followed by sales and service, 18 percent; operatives, 15 percent; craftsmen, 6 percent; others, 2 percent.

A pilot study of graduates of secondary schools in Suffolk County, New York who took their vocational education programs under differing schedules of time provides insights into administrative problems of arranging the cooperative use of area vocational education facilities by more than one supervisory district. In one supervisory district, the graduates had taken their vocational education program on a half-day basis over two years of study; in the other supervisory district, the graduates had devoted their entire senior year to a vocational education program. The latter arrangement was effected because the geography of the country made uneconomical the transportation of students to half-day sessions over two school years. The programs made available to the students were: automotive mechanics for the boys, and cosmetology for the girls. The groups compared were students who graduated in June 1966 and 1967. The group in the two-year program numbered 67 boys and 141 girls; the group in the one-year program, 38 boys and 40 girls. Follow-up questionnaires and interviews were used to gather information from graduates, parents, employers, instructors, counselors, and administrators. Findings include: 1) "It cannot be concluded that observable differences existed between the two groups which could be attributable to the particular instructional program." 2) "Little distinction can be made between the two groups in master of theory or manipulative skill." 3) "Students, in the half-day two-year program, especially girls, expressed dissatisfaction with this schedule more frequently than did students in the wholeday one-year schedule." 4) "Both parents and students expressed dissatisfaction with the severance from the home school, and some reported a feeling of being stigmatized." Adjustment to the situation seemed less difficult for boys than for girls. Satisfaction with their jobs was high in both

groups. Very few in either group were planning further education. In summary, it was not established that the differences in the administrative schedule produced an important difference in the outcomes as observed in the two groups of graduates (New York State Education Department, 1968).

STUDIES OF SPECIFIC PROGRAMS

Agricultural Education. Twelve state-wide studies of the occupational status of former enrollees in vocational agriculture are reported in *Review and Synthesis of Research in Agricultural Education* (Warmbrod and Phipps, 1966). This review also lists nine studies that compare the success of graduates of vocational agricultural programs with that of non-vocational graduates in either farm or non-farm occupations. Warmbrod and Phipps' (1966) summary indicates: a) considerable variation among states, a decreasing percentage of graduates who enter farming as an occupation—about 33 percent was most frequently reported; b) a rising percentage, 10 to 16 percent, entering non-farm but agriculturally related occupations; c) an increasing percentage entering non-agricultural occupations; d) farmers who have enrolled in agricultural education programs typically demonstrate superior farm practices, larger farm productivity, and higher farm income than farmers who did not enroll in vocational agriculture programs.

The status of persons completing full-time programs of vocational agriculture in secondary schools of the United States is reported in data prepared for the Congressional study. U.S. Senate Committee on Labor and Public Welfare (U.S. Department of Health, Education and Welfare, 1968). In 1966, two-thirds of those available for placement entered full-time jobs directly related to their preparation; a fourth were in full-time jobs not related to agriculture; five percent were in part-time jobs; three percent were unemployed. Eighty-seven percent of the graduates had been enrolled in courses emphasizing "agricultural production" despite a rapidly growing trend toward being placed in agri-business and other non-farm occupations. The fact that 72 percent of the graduates report continuing full-time in school suggests that further education is considered the route to non-farm occupations.

Wood (1967) reports background characteristics of 215 enrollees in agricultural education programs of five junior colleges in Illinois. Only one of the five colleges had produced graduates in 1966 (N=38). Twenty-six graduates responded to an inquiry about their occupational placement and success. Seven of the nine who were employed in an agricultural business were employed by firms in which the students had received on-the-job training while enrolled in college. Three graduates were farming; three were employed in non-agricultural occupations. Seven had continued to four-year

colleges; four were in military service. Of those employed, the average salary was $5,746. As students, they had set as a salary expectation, $8,530. Employees considered the junior college graduates more employable than secondary school graduates citing that practical training and greater maturity were definite advantages. Students considered on-the-job training as the most valuable part of their program.

A doctoral dissertation (Kahler, 1967) reports factors related to occupations of male high school graduates who lived on farms of Nebraska. Almost 1,000 graduates of 69 randomly selected high schools responded to this inquiry. About half (46 percent) of the graduates were found to be in non-agricultural occupations. Fifteen percent were in non-farm agricultural occupations; 38 percent were farmers or farm managers. One percent were farm laborers.

Priebe (1968) reports the 1967 occupational status of 120 graduates of selected secondary schools in North Dakota, who completed three or four year programs of vocational agriculture in 1959. This study reports that eight years after graduation 60 percent of the graduates were employed in agriculturally related occupations. Of these over 60 percent were in agricultural production. Immediately following graduation, only 43 percent went directly into agricultural occupations, but 40 percent had continued to post-high school educational programs. By 1967, over 30 percent had completed post-high school vocational and technical training. Two-thirds of the graduates had remained in North Dakota, and more than half lived in the community in which they attended secondary school.

Matteson (1966) studied the occupations of graduates of vocational agriculture programs in a sample of high schools in northeastern Wisconsin. Findings are detailed in a later section of this review on geographic mobility.

Distributive Education. In a Review and Synthesis of Research in Distributive Education, Meyer and Logan (1966) summarize six follow-up studies, and cite four master's degree theses of local scope. Findings of these descriptive studies indicate considerable variation in the post-secondary school histories of graduates of distributive education programs. The percentage remaining in distributive occupations was: 35 percent after ten months in Michigan (Harris, 1964); and 50 percent after six months in New York (Hecht, 1963); 61 percent after a longer period in Virginia (Ely, 1964). A study comparing employees in distributive occupations who had participated in distributive education programs with employees who had not taken such training reports presented no reliable differences between them in type of job, job performance, or salary (Zancanella, 1965).

Rapid growth in enrollment in distributive education courses throughout the Nation is reported; 26.1 percent between 1965 and 1966. Seventy-two percent of the total enrollment was in adult programs. Fields of greatest interest were general merchandising, real estate, and management. Thirty-eight percent of the graduates report that they are not available for placement. Full-time enrollment in school or college, or service in the Armed

Services, account for 85 percent of those unavailable for employment. Of those available for employment, 78 percent enter occupations related to their training; 13 percent are in unrelated occupations; five percent are in part-time work; four percent are unemployed. (U.S. Department of Health, Education and Welfare, 1968).

A follow-up study of graduates of a program in hotel and restaurant education at six junior colleges in Florida reports: 1) 40 percent of their graduates continue to further education in four-year colleges; 2) those entering jobs upon graduation find employment in a wide variety of mid-management posts in hotels, motels, hospitals, retirement homes, country clubs; 3) immaturity for responsibilities at mid-management level is cited as a drawback to the program; 4) work-study arrangements are recommended. (Almarode, 1968).

Larson (1968) reports a study comparing a sample of general college students in the University of Minnesota who had completed a retail and selling program during 1959-1961 with a comparable sample of general college students who had entered in 1958 but had not participated in the retail and selling program. Comparisons were made on student characteristics obtainable from student records and work experiences obtained by questionnaires to which 83 percent of 157 students responded. The students reported on first job, current job, and job satisfaction. No statistically significant difference between the groups was observed on factors usually related to academic potential or academic achievement as measured by GPA. A higher proportion of the retail and selling groups was observed on factors usually related to academic potential or academic achievement as measured by GPA. A higher proportion of the retail and selling groups received associate of arts degrees. No important differences were found in the type of first job, the length of time the entry position was held, or the way in which the student obtained his first job. When jobs currently held (in 1965) were considered, the retail and selling group were distributed proportionally among clerical, sales, professional-technical and other types of jobs as they were in their first jobs.

Haines (1965) reports on graduates of cooperative programs in trade and industry programs in secondary schools of Michigan. This study is combined with similar information on graduates of cooperative programs in office and distributive occupations.

Health Occupations. Special occupational follow-up studies of graduates of programs of health education programs were not discovered in the search made for this review. Inclusion of this field in vocational-technical programs is comparatively recent and in 1966 enrolled only 4.5 percent of the enrollees in federally-reimbursed programs. Of those enrolled, 11.7 percent were enrolled in secondary school programs, 43.6 percent in post-secondary programs, and 44.3 percent in adult programs. Fifty-seven percent of all enrollees were in programs preparing the practical nurse, the others were preparing for positions as dental and medical assistants, aides, and technicians. Eighty-four percent of these graduates were available for employ-

ment upon graduation; and ninety-two percent of those available were placed in occupations related to their training. Only two percent were unemployed. (U.S. Department of Health, Education and Welfare, 1968).

Reports about these graduates are covered in state summaries of vocational technical programs. Special research studies are less frequent among the relatively recent programs and in fields in which a large part of the graduates are in adult programs.

Frazier and Stevenson (1967) made a follow-up study of graduates of two licensed practical nurse programs offered by two high schools in the Oklahoma City Metropolitan Area. Twenty-one were graduates of a program offered at Midwest City for high school seniors—the only program offered at this level in the State. Twenty were graduates of the licensed practical nurse program in Oklahoma City offered to adults. The groups were compared by employer ratings obtained by using the Goertzel Job Success Rating Scale, time required to find employment, job stability, salary, satisfaction with course. The investigators conclude that, while their data are sketchy, the two programs obtained similiar results, and recommend that "additional programs for high school seniors be initiated wherever and whenever possible."

Foree (1968) reports a study of 50 persons who discontinued their studies before completion of a practical nursing program at Laramie, Wyoming, an MDTA program. The 50 "early-leavers" were compared with 48 graduates. The investigator indicated that his data suggests that the probability of students completing the course would be strengthened if the entrants were over 22 years of age. Seventy-five percent of the "early-leavers" were engaged in some phase of nursing.

Home Economics. Chadderdon and Fanslow (1966) report in their *Review and Synthesis of Research in Home Economics Education:* "Only a bare beginning has been made in developing instruments for use in wage-earning programs," and "As yet, few studies have been completed relating to programs designed for wage-earning." The search for follow-up studies of graduates of such programs conducted for this review confirms this finding. Most of the studies reported are those planned toward determining the elements desired in programs of home economics oriented toward occupational preparation rather than studies of the occupational careers graduating from such programs. Roberts (1966) found that among 1,640 homemaking students in 82 schools of Arkansas, three-fourths had been employed since leaving school, mostly in clerical, sales, and service occupations. Employers tended to prefer students from homemaking courses, and students cited training in grooming, personal relations, and etiquette as helpful in getting and keeping jobs.

Fentress (1965) studied 320 former students of home economics in Ohio. Two-thirds were employed outside their homes, but only one-fourth of them in home economics related jobs. Most of those employed were in part-time jobs only. These girls prefer to be assistants to teachers, homemakers, waitresses, appliance or food demonstrators than to be maids,

short order cooks, and housekeepers. These students, however, were not all enrolled in programs designed for wage-earning occupations.

Only .6 percent of all persons completing vocational education programs in 1966 were completing home economic programs that prepare for wage-earning occupations. Of these only 40 percent were available for employment. Three-fourths of them not available for employment had not continued to further schooling. Of those available for employment 76 percent entered occupations related to their training in home economics, and another 10 percent were in unrelated jobs; eight percent were in part-time jobs; six percent were unemployed. (U.S. Department of Health, Education and Welfare, 1968).

Office Occupations. Lanham and Trytten's *Review and Synthesis of Research in Office Occupations* (1966) reports meager activity in follow-up studies, citing Cook and Lanham (1966) and Haines, (1965). Haines includes graduates of office education programs with graduates of distributive and trade and industrial programs in follow-up studies of trainees who participated in cooperative education programs in high schools of Michigan and completed their work in 1962 and 1963. Reports of their occupational status two years and ten months after graduation are given. The following facts are revealed about office education graduates: 1) ten months after graduation, two-thirds of the 1963 graduates were employed full-time; another 15 percent were in part-time jobs; a third were attending school or colleges and only six were unemployed; 2) 80 percent of the graduates obtained employment within three months after graduation; 3) about two-thirds of those employed were in the field of their preparation; 4) between 60 and 70 percent were employed by an employer who participated in the cooperative education program; 5) 88 percent were employed in the vicinity where their education was obtained; 6) 53 percent of the graduates were employed by firms offering "personal and business services"; 7) girls placed in office occupations received substantiating higher rates of pay than girls who were employed in distributive or trade and industrial occupations, but received lower rates of pay than boys who entered distributive and trade and industrial occupations; 8) almost half of the office education graduates were in the upper quarter of their class measures of scholastic achievement; 9) a third of the graduates attended a post-secondary school or college, 60 percent of them continuing their studies in office education. Over 60 percent worked full or part-time while attending college. The two-year follow-up of 516 graduates who completed their work in 1962 revealed that: 1) of those employed in office occupations, 77 percent had been trained in that area; 2) 30 percent were employed by the firm in which they had received their cooperative education.

Fairbank (New York State Education Department, 1968) studied the use made of training in bookkeeping by graduates of 60 selected public high schools in New York State. The schools were located in rural communities, small-city suburban communities, large cities, and in New York

City. Over 2,000 students responded to the inquiry. About 85 percent had been out of school for four or five years. The graduates were separated into groups according to the extent of their training in bookkeeping. The primary data reported are frequencies with which students reported business, educational, or personnel uses of bookkeeping knowledge. Findings include: 1) Two-thirds of the students who had student bookkeeping reported using it in office or store work since leaving high school; 48 percent reported having bookkeeping positions; 2) sex differences in use of bookkeeping were not important; 3) use of bookkeeping did not differ according to size of community in which training was received; 4) employment in service businesses was reported more frequently than employment in merchandising and manufacturing. No data on income, place, or stability of employment was reported. The national picture indicates that in 1966 office education graduates contributed almost 40 percent of all graduates available for employment. Of these 81 percent were placed in full-time jobs related to their preparation; 9 percent were in unrelated jobs; 5 percent were employed in part-time work; 5 percent were not employed. (U.S. Department of Health, Education and Welfare, 1968).

Technical Occupations. Larson's (1966) *Review and Synthesis of Research in Technical Education* reports six state and area follow-up studies of graduates and former students in technical education. No summary of findings is provided. Technical education programs produced 3.5 percent of the graduates available for employment in 1966. This figure may be misleading because of differences in classifying programs among certain fields, notably between trade and industry, health, and other fields that train technicians. Of those available for placement, 90 percent were placed in jobs related to their training; seven percent more were employed in unrelated occupations; two percent were in part-time jobs, and one percent were unemployed. (U.S. Department of Health, Education and Welfare, 1968).

Other than a study evaluating effectiveness of technical training programs for persons employed at an air force base (Loveless and Holmes, 1968), no research report was found in the search for this review. This study compares the job-performance of graduates of training programs at three Utah colleges with employees who did not have such training, and makes curriculum recommendations.

Trade and Industrial. Trade and industrial programs produced 23.5 percent of all persons available for employment in 1966. Eighty percent of those available were placed in occupations related to their training; an additional 14 percent were placed in unrelated jobs; 3 percent were in part-time employment; 3 percent were unemployed.

The most extensive inquiry in any single field is Eninger's (1968) nationwide study of trade and industrial education at the secondary school level. Graduates of 100 schools randomly drawn from those which offered these or more courses in trade and industrial education. The sample was stratified

according to geographic region, enrollment size, and whether vocational, technical or comprehensive in type. Graduates of 1953, 1958, and 1962 classes were followed up in an inquiry terminating June 1964 (N=5,327 usable returns).

Summary findings are: 1) A great majority of trade and industrial graduates typically go directly to work, 36 to 40 percent, enter unrelated jobs. The longer the period between graduation and job, the more likely the job will be unrelated to training; 2) starting salaries depended upon local labor markets, and were not greatly different from starting salaries of a comparison group of graduates who had academic majors; those in training-related jobs were not greatly different from those in unrelated jobs; 3) two years after graduation the graduates had experienced a 35 percent increase in mean hourly rate, and were being paid substantially higher rates than the academic graduates with whom they were compared; the mean rates of pay of graduates on related occupations by this time had surpassed the hourly rates of those in unrelated jobs; 4) the graduates in related occupations reported a high degree of job satisfaction, expressing higher satisfaction than either the academic graduates, or those who were in unrelated occupations. Job satisfaction increased as the graduates progressed from the first job to later jobs; 5) 80 percent of the 1962 graduates had been employed from 90 to 100 percent of their employable time since obtaining their first job. Graduates placed in jobs related to their training surpassed the academic majors on all measures of employment security tested; 6) a high degree of employment stability after an initial period of job change was observed. Few graduates reported more than three employers. This stability was characteristic of graduates whether in related or unrelated jobs; 7) about 87 percent of the graduates had never moved out of the community in which they went to school. Of those who moved, almost three-fourths moved to locations within 300 miles of the community in which the schooling was received. Of those who had changed communities, only one in four had moved more than once. The moves were observed not to be associated with finding jobs in which specific training would be used.

This study details much background information about schools, families, teachers, curricula, facilities, school services, and administration.

Eninger (1967) analyzed for New York State the data compiled in his nation-wide vocational and comprehensive in that state. Five hundred fifty-one graduates (52 percent of all graduates) responded to the inquiry. In comparison with students in the national study, the New York students differed in the following ways: 1) New York students were less influenced by job opportunities and more influenced by counselors in selecting this course of study; 2) higher percentages went directly to college; lower percentages went directly to work; 3) had slightly higher rates of pay; 4) higher percentages of graduates obtained jobs in the communities in which they were trained; 5) lower percentages reported need for additional training in mathematics and communication skills, but higher percentages reported to have learned little practical job knowledge in high school; 6) gave lower

ratings to school and shop facilities, vocational counseling, teacher interest. Implications mentioned were that there should be more emphasis on student needs and less on employer needs; and that increased attention should be given to placement services (New York State Education Department, 1968).

In a study that is smaller in scope than the Eninger and Kaufman *et al.* studies, Bournazos (1963) compared graduates of trade and industrial programs with non-vocationally-trained graduates of public and parochial high schools in Lansing, Michigan. His sample included 47 vocationally-trained public school graduates, 40 non-vocationally-trained public school graduates, and 36 non-vocationally-trained graduates of parochial schools. Measures of job stability, job mobility, occupational group, or wage level were used as the basis for comparison. Occupational career patterns were observed over the period from June 1956 to December 1962. Bournazos reports that trade and industrial graduates as a group had greater job stability than the non-vocationally-trained graduates, and were employed more months during the period studied. Non-vocational graduates of parochial schools were observed to be more frequently in insecure work patterns than were non-vocational graduates of public schools. Trade and industrial graduates were observed to be in lower paying jobs than non-vocational graduates of public schools, but the difference was not statistically significant, and Bournazos advises that this finding be reexamined with larger samples. He speculates that trade and industry graduates may be more willing than their comparison group to accept low paying jobs in their field of training. About half of the trade and industrial graduates entered and were currently employed in jobs related to their field of training; but a fourth to a third of the non-vocationally trained were also in such jobs. Background characteristics are cited as exerting greater influence on career patterns of the students observed than the type of curricula they studied.

SUMMARIES OF PLACEMENT INFORMATION

Statistical Summary. The following table summarizes some numerical facts about the placement of persons completing vocational programs in 1966.

TABLE 1. PLACEMENT OF PERSONS COMPLETING VOCATIONAL PROGRAMS*

FIELDS	Percent Continuing Education	Percent Available for employment	Percent of available (1) Related to Job	Placed in: (2) Unrelated to Job
AGRICULTURE	38	44	67	25
DISTRIBUTIVE	23	55	78	13
HEALTH	5	84	92	3
HOME ECONOMICS	13	40	76	10
OFFICE	22	62	81	9
TECHNICAL	22	56	90	7
TRADE-INDUSTRY	18	58	80	14
TOTAL	23	57	80	12

* Adapted from Tables in "Growth and Development of Vocational Education," Chapter 2 of Publication 1, *Notes and Working Papers Concerning the Administration of Programs.* A Report prepared for the Committee on Labor and Public Welfare, U.S. Senate, March 1968, pp. 128-135.

The full meaning of the data in Table 1 is obscured because information is not given for the programs at each level of preparation—secondary school, post-secondary, adult and for persons with special needs. It can be observed that programs which are offered primarily at post-secondary levels—e.g. health and technical occupations—have the highest levels of placement in training-related jobs. Agriculture and home economics which are offered primarily at the secondary level show low levels of placement in training-related jobs. Office education is also offered primarily at the secondary school level, but has a much higher rate of placement in training-related jobs. United States enrollment figures for 1966 show that enrollments in agriculture (56 percent), home economics (67 percent), and office programs (65 percent) are concentrated at the secondary school level. Enrollments in health (47 percent) and technical (40 percent) programs are primarily post-secondary, but also have substantial numbers of programs having equal enrollments of adults. Enrollments in distributive (72 percent) and trade and industry programs (63 percent) are preponderantly in adult programs.

How Employment was Obtained. The preponderance of reports show that the great majority of vocational-technical programs rely heavily on family, friends, and direct personal appreciation to obtain their first jobs. Kaufman and Lewis (1968) report that 30 percent of the men obtained jobs by direct application; 29 percent by family or friend; 24 percent by school placement; 17 percent by employment agency, newspaper, or other means. The percentages for women were similar, but women made more use of employment agencies. Graduates of vocational programs fared better in finding jobs than graduates of general and academic programs. Less than 10 percent of the men, and between 10 and 20 percent of the women, report getting their first jobs through school placement. Kaufman and Lewis (1968) comment, "In general, the bridge between training and employment is an informal and unstructured one in which the individual's immediate environment is a major factor in determining where he will seek employment."

Kaufman, *et al.* (1967) corroborates these findings and finds that the situation holds for both white and negro students, male and female. The investigators comment, "At least one-half of all vocational graduates secured their jobs through their own devices."

Eninger's (1968) nation-wide study shows that among the 100 schools in his sample 25 percent was the median percentage of graduates of trade and industrial programs who acknowledged the school's helpfulness in getting their first full-time job. This percentage was 34 percent for the graduates of the vocational schools, however, as compared with 23 percent in the comprehensive schools. In Eninger's (1967) New York study 30 percent of the graduates found their first job through the help of a teacher, counselor, principal, or the school placement service. Help by relatives or friends was cited by 37 percent.

Jeremias (1968) tabulates methods used by employers in Philadelphia when hiring new, inexperienced employees. The use of teachers, counselors, and coordinators constitute from 26 to 33 percent of the various means used in recruiting employees. Want ads comprised 61 percent of the responses and employment agencies, 50 percent. High school cooperative education programs made up 28 percent of the means reported. To the extent that these practices are characteristic of employers generally, the disparity between the means used to recruit employees and the means used by graduates to obtain employment deserves attention. The point at which the two lists coincide is upon "friends and relatives" which constitutes 56 percent of the means reported by employers, and is a consistently high percentage among the means cited by graduates seeking employment.

A follow-up report of the graduates of post-secondary programs at Kenosha (Wisconsin) Technical Institute suggest that the means used to find jobs at this level may be not much different from those used by high school graduates. A summary for the 1967 graduates (N= 205) shows that 40 percent obtained initial employment through direct application, or through a friend or relative; 20 percent were placed through technical

institute personnel services; these percentages vary markedly, however, from field to field. In general, where the number of graduates is small and in limited supply the proportion of placement by the school is high. (Kenosha Technical Institute, 1967).

Bournazos (1963) study reports that among the 22 percent graduates of public school vocational programs found their first jobs through school teachers or counselors; only 6 percent of the non-vocationally trained in public schools, and 9 percent of the non-vocationally trained in parochial schools, were so helped. Sixty-three percent of the vocationally-trained graduates found their jobs through direct application (22 percent) or through relatives or friends, (41 percent).

The Missouri state-wide study reports that more than half of that state's 1965 graduates who went directly to employment obtained their first jobs by their own efforts. Only 4 percent of the men and 7 percent of the girls report help from the school. Friends and relatives are credited 31 percent of the boys and 23 percent of the girls. (State Department of Education, Missouri, 1968).

The San Mateo California follow-up study of the 1966 class in nine high schools gives information on questions that employers ask graduates who are seeking employment. The findings are listed below:

	Yes
Were you required to be a high school graduate?	74%
Were you asked the name of your high school?	81%
Did the employer ask to see your diploma?	11%
Were you asked about your academic grades?	50%

Placement. Jeanroy (1968) studied needs for and made recommendations about placement services for two-year college graduates. The study reports that among 132 two-year colleges sampled among 14 states, almost half (48 percent) do not have institutional placement service. About three-fourths vote for a regional placement service tied in with a national clearinghouse.

Geographic Mobility. Studies report consistently that high proportions of graduates of secondary school programs find and remain in jobs in or near the community in which they attended school. The typical situation is portrayed in the study of Matteson (1966) who followed up 310 graduates of vocational agriculture programs in 10 randomly selected high schools in Northeast Wisconsin who did not continue to college. Four out of five graduates remained in the communities in which they attended high school, although three-fourths of these were in occupations different from the occupations of their fathers. The fewer units of agriculture they had taken, the more likely they were to find jobs outside the community. Factors other than the kind of programs studied seemed to be controlling the type and location of job. Eninger (1968) reports that 87 percent of the secondary school graduates of trade and industry programs "had never moved out of the community in which they went to school." In his New York State study, Eninger (1967) reports "There is very little geographic mobility

among New York vocational graduates. Respectively 93 percent, 84 percent, and 76 percent of the 1962, 1958, and 1953 graduates have never moved out of the city in which they went to school." Only 11 percent of the 1953 graduates had made moves to a new city during 11 years since their graduation. Kaufman *et. al.* (1967) report "at most only about 8 percent of the sample moved for reasons directly connected with civilian jobs." This study includes all graduates of vocational, academic, and general programs of the sample of schools in Ohio, Pennsylvania, New York, and New Jersey, and Maryland. Haines (1965) in his study of cooperative program trainees in distributive, office, and trade and industry occupations reports "ten months after graduation more than eight out of ten (81.5 percent) are still visiting in the same county where they received cooperative training. When consideration was given to the fact that standard metropolitan areas often extend over county boundary lines, Haines concluded that "88 percent of these occupationally-trained individuals remain in the same general vicinity where they received their training." The Missouri State study (1968) of its 1965 graduates asked, "How far from your high school is your present or last job located?" Fifty-two percent of the men and 55 percent of the women reported "less than ten miles." Between 75 and 80 percent of both men and women reported "less than 50 miles." This study included graduates of all types of secondary school programs.

Studies of graduates of two-year college vocational programs are too few and fragmentary to get a reliable reading. However, a good hypothesis is that geographic mobility increases, as level of training increases. Leaving the community to obtain training may itself enhance mobility. No studies were found which report comparative information about location of jobs of persons in terms of whether they obtained training in their home communities or in communities some distance away.

Earnings. Information about earnings of the graduates is not easy to interpret. Inconsistency in reporting practice, absence of knowledge about local labor markets, differences in wage levels between vocational programs, differences in levels of education and training, differences in geographical location, changes in the value of the dollar, and scarcity of comparative information about occupational status of graduates of non-vocational programs makes summaries of information expressed in dollars hazardous, if not useless.

The following studies yield observations about trends in earnings of vocational program graduates, with some comparison with graduates of non-vocational programs: Eninger (1968) reports wide school differences in starting wages of trade and industry graduates, with low average levels of income. In comparision with graduates of nonacademic programs who did not attend college, the trade and industry graduates were starting with about the same average weekly earnings, but their comparative status was improving over the five year period studied (1953-1958). Graduates who en-

tered jobs directly related to their training and remained in such jobs from two to eleven years were shown to have higher earnings than non-college academic graduates. Kaufman, *et al.* (1967) point up differentials in starting wage levels between black graduates and white graduates. The black graduate "does not receive the same level of compensation in the first job, either at the inception or thereafter, as does his white counterpart." Differences in the starting pay rates among graduates of vocational, general, and academic curricula were minimal; and "increases in pay per unit time in the first job were generally comparable. The data suggest that, in the long run, there may be "some payoff" advantage for vocational graduates over the compensation of non-vocational graduates." Kaufman and Lewis (1968) report that "on all three indices (employment stability, earnings progress, and average monthly earnings) graduates of the vocational curriculum were sufficiently better than the graduates of academic and general curricula. . . The advantage appeared to be associated with obtaining a job which was related to their preparation." A sidelight finding was that the findings of the study did not support the assumption that IQ or race are explanatory variables" in accounting for differences in earning. Eninger's (1967) New York study as summarized by the New York State Education Department (1967) states that "the general trend seems to be that vocational graduates have come from behind, caught up with, and surpassed the academic graduates." A study in Connecticut reports earnings considerably over the state average by vocational graduates both five and ten years after graduation (Connecticut State Department of Education, 1967).

Haines (1965) compares weekly earnings of men and women graduates of cooperative training programs in office, distributive, and trade and industrial programs in Michigan. The data show differentials in favor of trade and industrial occupations which employ mostly men, in comparison with office occupations that employ mostly women. Earnings in office occupations exceeded earnings in distributive occupations. Corazzini (1966) reports a study of earnings of graduates of vocational programs in high schools and technical institutes in Worcester, Massachusetts in comparison with earnings of graduates of non-vocational programs which revealed too small differentials to justify the higher per unit costs of current vocational programs in these institutions, and called for reconsideration of types and sites of occupational training. Carroll and Ihnen (1968) demonstrate that graduates of two-year post-secondary vocational programs substantially improved their earning power over high school graduates from their home communities that had similar academic records in high school. The increased earning power was sufficient to recover costs of the additional training both to the graduate and to the society that invested in him.

Job Stability and Satisfaction. One measure of the effectiveness of an occupational training is the degree to which a trainee enters an occupational field and finds satisfying progression in his occupational career. Information is fragmentary and sporadic on this point. The following studies

illustrate the types of findings reported. Haines (1965) reports that ten months after graduation the percentages of graduates of cooperative training programs who were in occupations directly related to their training were office occupations, 85 percent; distributive, 35 percent; trade and industry 71 percent. The tendency for female distributive trainees to become trade and industrial workers account for most of the variations among the three fields. Over 90 percent of the trainees in these fields found employment with employers who participated in the cooperative training programs. This fact bespeaks a considerable degree of satisfaction by both trainee and employer. In Eninger's (1967, 1968) studies of trade and industry graduates, higher degrees of satisfaction with jobs is reported by vocational graduates than by graduates of other curricula. Job satisfaction is higher among those placed in jobs related to their training. Job dissatisfaction is reported as the reason for leaving the first job by only 15 percent of the graduates. These studies also report that over the years there is a gradual loss of graduates placed in training-related-jobs to training-unrelated jobs. This loss is not compensated for by graduates who had related training but had been placed first in unrelated jobs. Eight percent of the graduates in New York State had held fewer than five jobs over a period from two to eleven years. The average number of jobs was 2.4 percent. Kaufman and Lewis (1968) report that job supervisors rated graduates of vocational, academic, and general curricula as having no differences in preparation for their first job and performance in it. The graduates, however, had differing perceptions of their preparation and performance. The graduates of vocational programs believed themselves to be better prepared. Kaufman and Lewis' data further indicate that both male and female graduates were "less than completely satisfied with their pay and opportunities for promotion in their first jobs." Relationships with supervisors were rated more favorably than the actual job conditions. Women, particularly, were dissatisfied with their opportunities for promotion. No important differences in these ratings were observed among graduates of the three curricula—vocational, general, and academic.

In a study limited to Wisconsin vocational agriculture graduates Matteson (1967) reports a high degree of job satisfaction although 80 percent were employed in the locale at which they went to high school and 75 percent in jobs dissimilar to that of their fathers. Forty percent had remained in their initial jobs for at least four years.

Kaufman, Schaefer *et al.* (1967) provide useful information about employer attitudes and opinions. By interviews with 658 employers in nine cities, and through questionnaire responses from 340 of the same group of employers it was found that "64 percent of the respondents felt that the schools were doing an adequate or better job of preparing youngsters for employment." Less favorable attitudes were expressed by employers who employed non-white graduates than by those who did not employ such graduates. Most employers (54 percent) rated the preparation of the graduates as "very good" or "good"; an additional 29 percent rated the prep-

aration as "adequate." The majority of employers (54 percent) do not believe that young employees (high school graduates) switch jobs excessively, although 15 percent cited job-switching as a deterrent to employing young high school graduates. Attitudes of labor union officials are also shown. Forty-eight percent thought that local schools were doing an adequate job of preparing youth for employment; 32 percent thought that the preparation was not adequate. Responses of officials of unions that had apprenticeship programs coordinated with high school vocational education programs (30 percent of the unions) indicated that only about half of the unions gave credit toward apprenticeship for work taken in high school. Kaufman, Schaefer *et al.* observe that both employers and union officials have had little or no contact with vocational programs in high school, and tend to give hazy or uninformed answers about the adequacy of vocational education programs. Commenting on differential experiences of black graduates and white graduates, the Kaufman, Schaefer *et al.* study reports "even though differences in job types and compensation were revealed, there were no substantial differences between Negroes and whites in job satisfaction expressed either by the employees or employers." Male Negroes, however, more frequently showed unwillingness to recommend the vocational curriculum. Eninger (1968) in his nationwide study of trade and industrial graduates reports that higher degrees of job satisfaction are expressed by graduates of vocational education programs who are placed in training and related jobs than by those placed in training-unrelated jobs, and by the graduates of non-vocational programs. The degree of satisfaction increases with job progression in the field in which trained. The overall employment security of the vocational program is also high, 80 percent of the graduates being employed 90-100 percent of their employable time, with 65 percent being employed 100 percent of the time. These figures are substantially higher than those for non-vocational graduates.

Continuing Education. National data indicate that large proportions of the number of persons completing vocational programs move to further full-time schooling rather than directly to work. See Table 1 in previous section on *Summaries of Placement Information.* Such information is reported in many local, state, and system studies in this review. These studies illuminate the variability of this information as between regions, communities, and special groups of graduates. Facts such as these are important in both counseling and curriculum development and emphasize the importance of articulation between vocational programs in secondary and post-secondary institutions.

STUDIES OF SPECIAL GROUPS

Manpower Development and Training. A nation-wide report on training programs established under the Manpower Development and Training

Act furnishes information about the placement, earnings and other follow-up data of persons completing such programs. In 1967, 86 percent of the trainees enrolled completed their programs of training. Of these completing their programs of training, 72 percent were placed in jobs; of those jobs, 777 were training-related. The effect of educational attainment upon placement is revealed by the fact that 67 percent of those who had 12 years or more of schooling were placed, while only 52 percent of those who had eight years or less of schooling were placed. A one-year follow-up of the 1966 graduates of MDTA training programs found 83 percent employed; 11 percent unemployed; 6 percent not in the market for work. Four out of five had been employed for at least nine months of the year following their training. Employment rates for whites and non-whites were both high, 84 percent and 80 percent respectively, although a larger proportion of whites were placed in training related jobs than non-whites, 68 percent and 55 percent respectively. "The data on trainee earnings show that completers have more stable employment and higher earnings after training when compared with their own pre-training experience and with control groups who had not been exposed to training." The report recommends that special studies be made to determine the relative contributions of such factors as quality of instruction, quality of counseling, effectiveness of orientation to first job, or to combination of these to the success of the program. (U.S. Department of Health, Education and Welfare, 1968).

London (1967) conducted a follow-up study of 518 MDTA trainees, six, twelve, and eighteen months after the completion of their programs in three cities of Missouri between October 1964 and September 1965. Almost all trainees had been born and reared in the communities in the city in which they took training. On the average, they had completed between ten and eleven years of schooling. Almost a fourth had been receiving some form of welfare. About half were married. Their work history had been erratic and irregular with earnings averaging between $1.02 to $1.25 per hour in mainly skilled, semi-skilled, unskilled and service occupations. Thirty percent had been unemployed for 50 weeks or more. Following training, practically all remained in the same places where they had lived prior to training. They were employed in the same types of occupations as formerly, but were earning on the average $1.56 for the first six months, $1.67 for the second six months, and $1.72 for the third six-month period following training. Sixty-three percent were in training-related occupations in their first jobs, but this percentage dropped to 54 percent one year later. Employers rated the trainees as average on a set of desirable worker characteristics. Favorable indications of the effectiveness of the program were found on such matters as housing, savings, subsistence, travel, and continuing education.

A U.S. Labor Department report states, "Taken over all, median earnings for employed graduates (MDTA) were $1.73 per hour after training compared with $1.44 before training—an increase of 20 percent in the average earnings level, substantially greater than the average increase in

wage levels in the economy during the same period, (1964 and 1966)."

Silverman (1967) cites the short and long-run employment outcomes of a special project carried on at Florida A & M University. In evaluating this project, Silverman reports that placement following training was reported by only half the trainees. Of these, the placement was typically in "black" jobs. The placement of trainees in white-collar occupations was low. Silverman recommends that projects of this type be planned to gain greater participation and cooperation of community agencies, have stronger staffing, give greater attention to job development and placement, and establish more comprehensive job-training programs.

Buenaventura (1967) reports an evaluation of an MDTA project operated by the Michigan Catholic Conference in Lansing. This project focused on the training of unskilled persons with little formal education and limited command of the English language. Buenaventura cites that the project upgraded the work skills of the trainees, decreased the number unemployed, and placed the majority in satisfying jobs.

Glaser (1967) reports an evaluation of the training programs of job opportunity centers in Pueblo and Denver, Colorado. He compared a sample of persons who had received training at one of the job opportunity centers with a control group of persons who would have qualified for training but did not receive such training. He used intensive interviews to gather the information. Only minimal differences in average take-home pay were found. In fact, few important differences were found on the variables studied. The differences between the two JOC Centers were probably more meaningful than the differences between the JOC groups and their controls. The variables studied include: Level of aspiration, self-concept, motivation, family stability, family harmony, property ownership, reading usage, and attitudes toward the program.

Johnson (1967) reports an evaluation of the MDTA training program operated at Tuskegee Institute. This project included both job development and job placement. Follow-up interviews with 38 out of 54 persons who had been trainees at Tuskegee Institute were conducted. About half the trainees were not placed when the project ended. From 66 percent to 80 percent of the trainees looked for a job on their own, and 33 percent to 58 percent found a job on their own. Most of those who had jobs were employed all the time since training. When compared with persons who had not received training, the trainees were shown to be more likely to have steady employment. The training appeared to produce better results when the trainees were married and older (over 35).

Correctional Institutions. Sullivan and Mandell (1967) report on the experiences in rehabilitation of youthful inmates of correctional institutions through special programs of vocational training. The field of training was in data-processing. Findings of this study include: 1) It was possible to develop jobs and place persons trained in correctional institution programs, although not all placements were in jobs directly related to the training. 2) Persons trained in correctional institutions experienced handicap of a

socio-cultural nature not present in the same degree among control trainees who had not been inmates of correctional institutions. 3) Job stability and advancement of the two groups were similar. 4) Differences in earnings were small.

As an outgrowth of this study the authors describe the development of a multi-phasic project entitled Social Restoration Through Vocational Education. This brief synopsis of this study does not do justice to this report which, while dealing with limited numbers in a single field of training, is replete with constructive suggestions and approaches to an important facet of vocational training.

An evaluative report on a project for the training and placement of youthful inmates of a correctional center in Alabama (Rehabilitation Research Foundation, 1968) is noted. The project's goal was to explore the possibility of reducing a high rate of recidivism through a program of occupational training and placement. Two-hundred twenty-eight trainees who had completed training between June 1965 and December 1966, were the subjects of a follow-up study. Training was in automative mechanics, electrical appliances, and barbering. Ninety-one percent of the trainees were placed with 361 different employers at an average beginning wage rate of $1.70 per hour, or $3,640 per year. In terms of recidivism, 70 percent were recidivists when they entered training, and 32 percent recidivated after training. The study has special interest because of its incorporation of programmed instruction in the learning process, and its use of college students in the teaching-counseling phases.

Aller (1968) cites as lessons learned from Restoration of Youth Through Training Projects (including the two cited above): a) rate of recidivism can be reduced by occupational training; b) type of training must mesh with available job opportunities of community to which ex-offenders return; c) job-development and job placement must be strong parts of the program; d) must have supportive counseling and social service in their communities. Glenn (1969) describes perceptions of inmates of Arizona correctional institutions about need for and value of occupational training programs, and makes recommendations.

Military Trainees. One of the largest programs of technical training is operated by United States Armed Services. A summary of a study by U.S. Department of Labor (1968) reports on the transition from military service to jobs by officers and interested men of the U.S. Air Force. Eighty-five percent of this group went directly to work; 15 percent to school, full-time or part-time. The higher their training and skill, the greater stability on the civilian jobs. Enlisted men from crafts-technical military assignments were earning $650 more, annually, than those from non-technical military branches of service. Approximately 40 percent of both officers and men said there was no need for their military training and experience in their civilian occupation. Educational levels were regarded as more important than military technical training, except in selected occupations.

Older Workers. Somers (1967) reported on the training and placement of hard-core unemployed workers in four community projects carried out by specialized agencies in Baltimore, Boston, Buncombe County, North Carolina, and Milwaukee, Wisconsin. The account details the complexities and difficulties of organizing and administering programs for these groups. None of the projects was able to reach its intended objective or stay with its original plan of action. Recommendations are made for improvement of such experimental projects.

Early-leavers. Much attention has centered on groups of persons who left educational or occupational training programs before completion of the program. Combs and Cooley (1968) in a study of broader scope compared the employment experiences of high school drop-outs identified in the Project Talent ninth grade sample with random samples of high school graduates from the same grade sample who did not enter a two-year or four-year college. The follow-up inquiry occurred one year after the graduates had completed schooling. The inquiry, thus, could have reached some of the drop-outs four years after leaving school. The average time after leaving school is not indicated. Information about boys and girls is reported separately. Full-time employment rates of graduates and drop-outs among boys were similar: graduates, 89 percent; drop-outs, 87 percent; salary levels were similar—graduates, $3,500; drop-outs, $3,650 (but with longer times on the job); occupational training after leaving school was also alike—graduate, 38 percent; drop-outs, 36 percent; types of jobs were—graduates, in unskilled, skilled, clerical and sales occupations; drop-outs, in unskilled, skilled, and service occupations. Among girls, 53 percent of the graduates had full-time jobs; among drop-outs, 26 percent. This resulted primarily from a much higher rate of marriage among the drop-outs—81 percent, as compared with 44 percent of the graduates. The graduate had an advantage in earning power— $2,790, compared to $2,570 for drop-outs. Thirty-eight percent of the graduates received occupational training after leaving school; only 16 percent of the drop-outs had further training. Graduates were employed mainly as stenographers, secretaries or clerical workers; drop-outs, as service workers in food industries, domestic services, and machine operators. The investigators point out that the full consequences of leaving school early "may not appear until later in life."

Bowser (1960) reports information on graduates and drop-outs of Virginia State College, Norfolk. Information about placement of graduates is more adequate than information about drop-outs.

Egermeier, *et al.* (1967) conducted a two-year follow-up study of individuals enrolled in 1964 in an experimental rehabilitation program for drop-outs operated in an inner-city high school in Oklahoma City, Oklahoma. Comparisons in occupational history were made between the following groups of students: a) those who had vocational training only; b) those who had academic training only; c) those who had a combination of vocational and academic training; d) those who applied for the rehabilitation

program but were not admitted; e) those who withdrew from the rehabilitation program before completing it. Two hundred seventeen students were involved in the study. Information was analyzed separately for men and women. The investigators report that the fact that "a varying pattern of results when different criterion measures of program success were used demonstrates that the phenomena under study are exceptionally complex and that there is no single mode of assessment that is representative." This conclusion followed an observation that during the first year of follow-up the vocationally-trained group appeared to have an advantage on most criteria but by the end of the second year the academic and non-rehabilitated group seemed to be closing the gap.

BENEFIT-COST STUDIES

Studies approaching the evaluation of vocational education through the technique of benefit-cost or cost-effectiveness analysis demonstrate conceptualizations and procedures in research which have long been missing throughout research in education. The purposes of such studies move beyond a description of the occupational status of graduates of vocational programs. The cost-effectiveness study asks and tries to answer the harder questions. Was the educational program worth its cost? to the individual? to the society which invests in it?

Warmbrod (1968) in his *Review and Synthesis of Research on the Economics of Vocational-Technical Education* mentions studies cited in this review and others that relate to the over-evaluation of vocational education programs through economic analyses and techniques, including benefit-cost studies. He counsels, "If vocational educators want to be involved in the important policy decisions concurring vocational-technical education, they must become familiar with the research and concepts of cost-benefit analysis, cost-effectiveness analysis, and planning-programming-budgeting system."

An example of this type of study is Kaufman, Stromsdorfer *et al.* (1968). This comprehensive report provides a rationale for the cost-effectiveness study and demonstrates its application to data gathered from three selected cities and samples of their graduates from the classes of June and January in 1959 and 1960. The students were graduates of academic, general, vocational-academic, vocational-comprehensive, or vocational-technical programs. The sample included all graduates of vocational-technical programs and one out of four of the graduates from the other three programs. None of these graduates attended college. The cities represented had differing industrial and labor market structures wage and employment levels, and geographical regions. Individual and family variables such as scholastic aptitude, race, sex, father's education were taken into account. Twelve hundred fifty-five graduates participated in the study. The follow-up inquiry occurred six years after graduation. Regression analyses are per-

formed to show the effects upon employment and earnings of all the variables studied. The investigators report that "vocational-technical graduates" have earned more and have been employed for a longer period than academic graduates during the six years after graduation, this differential holding after accounting for sex interaction and race interaction. Among the several curricula of vocational-technical programs, there was no difference in employment variables. Graduates employed in tool design had higher earnings; those in personal services had lower earnings. The programs for these cities were shown to be an "economically efficient investment" in terms of the employment experiences of this group of graduates. A study of the experiences of drop-outs of vocational-technical schools hinted but did not prove that drop-outs of these programs fare better vis-a-vis their graduate counterparts than do drop-outs from comprehensive schools. Studies of the voting behavior, career interests, and economic aspirations showed no important differences among graduates of different vocational-technical curricula. The study is useful for its methodological suggestions as well as its findings. Replications of many parts of the study on different samples of communities and graduates is suggested.

Corazzini (1966) conducted a cost-benefit study which compared starting-wage data of graduates of vocational high school and of post-high school vocational programs, with starting wage date of graduates of non vocational high school programs in Worcester, Massachusetts. In contrast to the Kaufman *et al.* study (1968) Corazzini finds the differential in employment and earnings among graduates of vocational technical programs not large enough to justify the personal or social investment by the individuals or community studied, and suggests reconsideration of the type and level of vocational education to be offered.

Carroll and Ihnen (1966) measure the cost and return of human capital created by investments in two years of post-high school technical education. The study compares 45 male white graduates of Gaston Technical Institute, a post-secondary institution, with 45 high school graduates. The members of the two groups are matched on the high school from which they graduated, and on scholastic achievement in high school. The difference in employment history and earnings is examined in terms of the economic return for time and money spent in two years of post-high school training. The Technical Institute graduates had but a $11 per month advantage on the high school graduate in his initial employment; but within four years he had increased this advantage to $107 per month. The work week of the Technical Institute graduates averaged 2.7 hours per week less than that of the high school graduates; the Technical Institute graduates also enjoyed more fringe benefits. After accounting for the social and private costs of obtaining the extra two years of training, Carroll and Ihnen estimate that the social rate of return of the vocational programs were 16.5 percent; the private rate, 22 percent; the value of non-monetary benefits is additional.

Row (1969) reports a cost-analysis of secondary school distributive programs in Wyoming in 1967-68. This study provides an example of the cost-analysis side of a cost-effectiveness study. It makes no attempt at benefit-cost analysis. Row's study points up that two-year programs have a cost advantage over one-year programs in Wyoming; that distributive education programs present additional costs because of cooperative relationships with business, and asks that similar data be developed for other fields of training.

Persons, Swanson and Kittleson (1968) applied benefit-cost analysis techniques to a study of samples of Minnesota farm operators who had enrolled in farm business management education programs in comparision with the average farm operator in Minnesota. They found the group who had enrolled in such courses more likely to be: 1) in the top three economic classes; 2) better educated; 3) significantly younger. Measured private economic benefits exceeded discounted costs by more than four to one. Community benefits measured in increased labor earnings were estimated to exceed community costs by two to one. The study provides a detailed rationale of the conceptual model and methodology of benefit-cost techniques.

Taussig (1968) conducted a study of the employment experiences of recent vocational graduates of vocational schools in New York City giving special attention to an economic analysis of the vocational education programs. He finds that "the direct market benefits from high school vocational education in New York City have been disappointing." The trade training had not been successful he concludes in enhancing significantly the productivity and earnings of its graduates, and had not been effective in combating the drop-out problem. Successful placement is a function of that fact that some employers use the educational program as a screening device in recuriting its employees, and cites the practice of specifying job entry requirements unrelated to specific types of training, and increasing on-the-job training.

FOLLOW-UP STUDY PROCEDURES

Several states and school systems have developed guides for conducting follow-up studies. These are in addition to the instruments developed for use in the actual follow-up studies reported here. A sample of those that have come to the attention of this reviewer are:

1) *Guidelines for Conducting Follow-up Studies of Vocational and Technical Education Students.* Michigan Department of Education (1965).
2) *Graduates Responses and Data Survey,* Missouri Department of Education (1965).
3) *The Tulsa Public Schools Look at the High School Graduates.* Tulsa Public Schools, Tulsa, Oklahoma, (1964).

4) *Vocational-Technical Student Survey,* Oklahoma RCU, Stillwater, Oklahoma, (1968).
5) *An Instrument to Evaluate Institutional Training Projects* (MDTA), Arizona State Department of Vocational Education, (1968).
6) *Follow-up Procedure for Post-Secondary Vocational-Technical Graduates,* Wyoming State Department of Education, (1967).

General discussions of follow-up studies and their procedures are found in:

1) *Conference on Follow-up Studies in Educational Research,* Center for Studies in Vocational and Technical Education, University of Wisconsin, 1965.
2) *Research in Vocational and Technical Education, ibid,* (1967).
3) *Occupational Education: Planning and Programming*—Volumes I and II. Stanford Research Institute, (1967).
4) *The Evaluation of Occupational Education Programs.* RCU, University of Minnesota, 1968. (Jerome Moss, Jr.)
5) *The Flow of High School Students to Schools, Colleges and Jobs,* American College Testing Program. Report No. 26, (1968).
6) *The Use of Follow-up Studies in the Evaluation of Vocational Education.* Washington, D.C. Bureau of Social Science Research, 1966, (Sharp and Krasnegor).

A special methodological study of interest is reported by Pucel, Nelson, and Wheeler (1968). The objective of this study was to test procedures for maximizing the percentage of returns from mailed questionnaires. Using a population of 1128 graduates of Minnesota Area Vocational-Technical Schools who had graduated 12 months before, 100 graduates were assigned randomly to 11 groups. Eleven different types of incentives or sets of incentives designed to elicit questionnaire returns were conceived. One of the eleven sets of incentives was used on each of the eleven groups. The percentage of returns varied from 42 percent to 62 percent. The responses increased with the number of incentives. The investigators conclude that follow-up returns can be increased substantially by increasing the novelty of the follow-up procedures. Since follow-up studies depend heavily upon questionnaire studies, such investigations have both interest and importance.

EVALUATION SUMMARY

Follow-up studies of graduates of vocational education programs, if carefully planned and executed, can provide an important base of information to educational planners and administrators, and to future vocational-technical students. Where coupled with appropriate economic analysis this type of information can point the way to improved decision-making by govern-

ments and institutions on questions of priorities among types, levels and fields of education and training programs, and on decisions about allocation of resources to these programs. There is considerable distance, however, between the present condition as revealed by the studies here reviewed, and the achievement of the goals desired.

The studies reviewed are of three types: 1) Administrative reports—information gathered to describe the occupational status of graduates of specified educational programs. These studies may expand somewhat upon informational reports furnished to state and Federal offices but the findings have little or no general applicability; 2) comparative studies—studies designed to compare graduates of differing types of educational programs within the same school, or within samples of schools in the same state, or within samples of schools drawn from many states. These studies demonstrate the conceptualization and procedures necessary to yield more generally useful information from follow-up studies; 3) benefit-cost studies further refine the analysis of occupational education and training information, demonstrating the types of information and research techniques required to establish the economic effectiveness of vocational education programs. The level of expertise and sophistication of the research reported increases in the order in which the types of research were named.

The interest of research workers in fields other than vocational education, particularly the economists and sociologists, is bringing a fresh viewpoint and cogency to this research arena, an entrance which vocational educators should welcome. Research activity has been dormant. Budgets for research upon educational programs of any kind at any level have been minuscule considering the large sums expended upon education. Well-defined and executed research projects using follow-up information are beginning to appear, and the prospect is that the quantity will increase and quality will improve.

Follow-up studies continue to be plagued by some inherent hazards—reliance upon questionnaires and interviews and the attendant problems of accounting for non-respondents, the devising of adequate samples of schools and graduates, with control by randomization of schools and graduates; securing cooperation of systems and individuals involved; the absence of crucial data about school costs; the conceptual and technical difficulties in assessing the benefits of educational programs. Research workers agree that important decisions are being made about occupational education and training programs without adequate information about their current or potential effectiveness. The pressing need is for programmatic research of such scope and depth that definitive answers can be found. The demonstration of such a research program within a state, a geographical region, a sample of states, or within a sample of schools from each of the states is needed. A replication of some of the comparative and benefit-cost types of studies on other samples of graduates would be worthwhile.

The literature reviewed for this report indicates that surveys of research activity reveal that few state departments or school systems have plans to

make a systematic evaluation of the worth of their vocational education programs. The economic evaluation of educational programs is a recent intruder into the bailiwick of educational administrators and government planners. Some school officers are skeptical of the objectives of such procedures. Some question their applicability. Some doubt the methods used. More have neither research budgets nor skilled research workers for mounting such evaluative efforts. As education's share to tax expenditures increase, however, it is fairly certain that educational administrators will be asked to provide better information than they now possess about the cost-effectiveness of their programs, vocational or non-vocational.

Despite the inadequacies and deficiencies of the follow-up studies, certain findings seem to constitute a refrain. The vocational-technical education programs are serving important parts of our population in ways that these people would not be helped without them. Those who move directly to jobs from such training have an advantage in earnings, not always great, but still an advantage over their untrained cohorts. Most persons like their jobs, and the vocationally trained persons are especially satisfied if they find jobs for which they are specifically prepared. The great majority of vocationally trained high school graduates obtain employment in or near the communities in which they attended school. Graduates obtain their jobs primarily from their own efforts or by the help of friends or relatives; secondary schools, teachers and counselors, are typically not credited with being greatly helpful to students moving to jobs rather than to colleges.

There is considerable variation in the occupational careers of graduates in the several fields of training. These variations are frequently associated with variations in the labor market. In general, graduates from the fields which emphasize post-high school training show a clear advantage over graduates of high school programs. In fact, the very completion of a diploma, certificate, or degree program seems to be the key factor. This fact points to the role of employment practices, with emphasis on paper credentials, as a strong element in determining occupational placement. Although the findings are contradictory, the preponderance of evidence is that vocational education programs are probably worth their cost. But this conclusion does not blanket in all vocational programs, in all places, or in all fields. The injunction is to find definitive answers to such effectiveness within more educational systems and programs.

The search for studies dealing specifically with placement activities was practically fruitless. Placement is typically viewed as a separate activity from the educational program. Few secondary schools conceive job placement as a built-in function. Propietary vocational-technical schools, however, strongly emphasize the placement function, and thrive upon excellent placement and other working relationships with business and industry. Ideally, successful placement should be the target of programs of education and training for employment, and this target should control the selection of programs for which training is offered, the nature of the learning experience, the selection of students to be trained, and the counseling activities incident

to the programs. The lack of well-developed placement programs may be a crucial weakness of many current programs of vocational-technical education.

To the research specialist this review yields little in the way of pregnant ideals and suggestions or techniques for future investigations. This situation stems from the facts, first, that sophisticated research in this field is in its beginning stages, and researchers are still groping for handles to the complexity of variables encountered in the evaluation of educational outcomes; and, second, this review and synthesis of research concentrates on findings rather than methodology. A critique of the methodology in this field is needed. Research specialists already acquainted with current investigations are seeking exchange of ideas about new conceptual constructs, promising research techniques, and developing facets of the problem. Such an effort would abandon the conventional exhaustive analysis of past investigations, and would concentrate on designing the system of research strategies which ought to be. Such an assignment would be exciting, demanding, and should be fruitful. Research in vocational education, as in any other field, would be helped if it were to concentrate on future-facing activities and strategies.

As a result of his study of the literature covered in this report, however, this reviewer has arrived at certain viewpoints and suggestions about the research problems and procedures dealing with follow-up studies and placement.

1. For research purposes, follow-up studies and placement should be viewed as a component of a larger system of studies—the evaluation of educational programs.
2. The evaluation of educational programs should use a systems approach in which the purposes of the educational program are defined clearly, outcomes of the programs are described specifically, higher criteria for achievement of purposes are developed, and research designs are adapted accordingly.
3. The procedures of cost-benefit analysis, or cost-effectiveness, exemplify the types of conceptualization required, but current studies illustrate that research strategies usually do not have general applicability. Researchers must wrestle with the central elements of their substantive problem. Specific research techniques or methods are effective only as they fit the problem.
4. A continuing major problem in the evaluation of educational outcomes is in separating the value added by the school experience from the effects of manifold non-school activities.
5. One important need is for a comprehensive longitudinal study of the in-school and post-school careers of cohorts of persons who move through the education system along different paths. It would seem that it is as important to know what hapens to the generality of youth in the educational system as to learn about the gifted as seen in the Terman studies of genius, or in the more recent Project Talent.

6. Most studies attempt to evaluate programs of education in terms of the organization of the educational system. They compare persons who have been enrolled in specifically named programs for specified periods of time with specified teacher-evaluators of achievement. Little research, if any, reports on persons when occupational skills and resulting employment come about through non-school activities.
7. Most research starts with persons in school and moves forward. Such studies should be complemented by acquiring better information about those being employed, including the nature of their pre-employment training, if any.
8. There is need for more explicit understanding of variations in the labor market and in employment practices as they affect the placement of graduates of education and training programs.
9. Current studies tend not to look at individual differences among graduates of training programs. Within-group analysis sometimes reveals useful insights not observed by use of statistical averages.
10. Current studies are frequently criticized because of their failure to use recommended statistical analysis. A more apt criticism would be failure to design studies in which sophisticated statistical analysis would be either appropriate or helpful.
11. A major error in many studies is inference of causal relationship between variables when either the data or method applied does not warrant the inference. This is a methodological and logical error which pervades research in many fields.
12. The basic weaknesses of the studies, from the research point of view, is their weak design and inadequate statistical treatment. In fact, many of the studies were not conceived as research. They provide much information but little knowledge. Contributions to knowledge, in the sense of useful applications of information to important areas of application, is a too infrequent outcome of much sophisticated research activity.

This review closes with a quotation from the report of the Advisory Council on Vocational Education, 1968.

> "Effective occupational preparations is impossible if the school feels that its obligation ends when the student graduates. The school, therefore, must work with employers to build a bridge between school and work. Placing the student on a job and following up his successes and failures provides the best possible information to the school on its strengths and weaknesses."

If this review stimulates more and improved studies of the vocational education product it will have achieved a good purpose.

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